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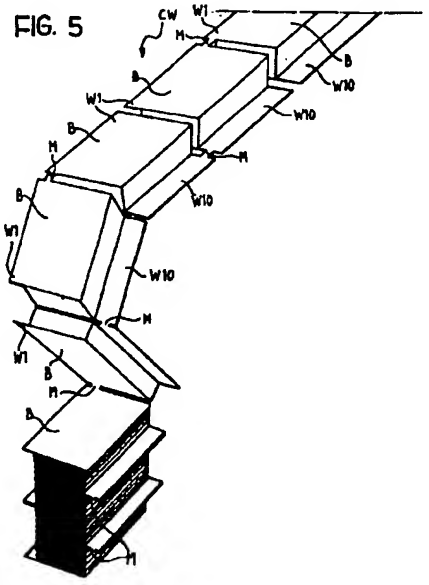
(54) a process and a device for producing packs of interfolded laminar articles and respective product

(57) A certain number of webs are subjected to interleaving in such a manner as to form a composite web in which the webs situated in the terminal (marginal) positions of the composite web have respective external branches (W1, W10) that project beyond the composite web. This composite web is then subjected to segmentation by means of a cutting operation that spares the said external margins in an alternating sequence. There is thus obtained a chain of stacks (B) interleaved products that are linked to each other by means of bridgelets (M) corresponding to the parts of the external branches (W1, W10) spared the cutting operation. The chain obtained in this manner can thus be folded in accordion-fashion to obtain packs of interleaved articles, where each such pack contains a number of articles corresponding to the product of the number of the interleaved webs and the number of stacks (B) superimposed on each other in accordion-fashion.

FIG. 5



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Description

[0001] The present invention relates in general to the realization of packs of interfolded (or interleaved) laminar articles.

[0002] A classical example of such an article is constituted by the so-called "paper" handkerchiefs (though these usually consist of cellulose wadding or so-called nonwoven fabric, according to whether the handkerchiefs in question are dry or prehumidified, often also referred to by such current terms as "wet wipes" or "facial tissues") arranged in appropriate packages (boxes or wrappers). The interleaved arrangement of the individual articles is intended to ensure that the removal of one handkerchief from the package will automatically predispose the next handkerchief for being pulled out of the pack.

[0003] The solutions currently utilized for realizing such packs of interleaved products can to all intents and purposes be divided into two basic types.

[0004] A first solution is based on the idea of causing two strips or webs of sheeted material to move forward in positions facing each other. The two strips are subjected to an operation of folding (and cutting, to separate the individual handkerchiefs) in interfacing positions such that the loops of the shapes - which usually consist of either V or Z-folding - conferred upon the handkerchiefs obtained from either the one or the other of the two strips will be at least partially interlaced. The result of this operation is the formation of a kind of chain of interfolded handkerchiefs of virtually indefinite length. The individual packs are then formed by introducing some solution of continuity into this chain. Examples of this type of solution are provided, among others, by US-A-4 494 741 and US-A-4 691 908.

[0005] In actual practice, however, this solution is penalized - especially in terms of speed and also complexity of the apparatus required for its implementation - by the intrinsic complexity of the operation that causes the two webs to assume a pattern with interlacing loops. Indeed, this operation is rendered even more complex by the need for accompanying it with a cutting operation to ensure the isolation of the individual handkerchiefs.

[0006] Another solution, which could be said to be based on an "in line" operating principle, sets out to form - by means of respective cutting operations performed simultaneously on a given starting bobbin, for example - a series of strips (or webs) such that the number of these strips is equal to the number of interleaved articles to be comprised in the pack it is proposed to realize.

[0007] The aforesaid strips are shaped in accordance with the conformation desired for achieving the interfolding and are made to converge towards a station where they are interfolded. As result, the process yields a composite strip or web comprising the originally separate strips in interfolded form. The composite web obtained in this manner is then segmentated by cutting it at predetermined distances, with each of the resulting segments constituting a pack or stack of interfolded laminar articles.

[0008] This solution overcomes the intrinsic limits of complexity and slowness of the previously described solution, but pays for this advantage in terms of general complexity of the systems, particularly when the number of interfolded articles becomes large (250 interfolded handkerchiefs, for example, in keeping with a format quite widely used in industrial applications). There also exists an intrinsic limit of flexibility deriving from the fact that consumer needs as regards the number of articles to be contained in a single package are highly variegated, so that the contents of such packages may range, for example, from just a few articles to more than two hundred.

[0009] Once the system has been configured for realizing packs of n interfolded articles, an apparatus operating in accordance with the "in line" principle" could possibly be converted for the realization of packs containing a smaller number of articles. But it is not possible to modify the system for the realization of packs containing a larger number of interfolded articles. In any case, even the reduction of the number of interfolded articles calls for a rather complex reconfiguration intervention (disactivation of the mechanisms feeding and dragging the webs in excess of the desired number, etc.), so that even this intervention could hardly be justified in cases where the functioning of the equipment has to be modified only for a relatively short period of time, say for the fabrication of only a small lot of such products.

[0010] The present invention sets out to provide an alternative solution capable of combining the positive features of both the previously described solutions, namely the simplicity and efficiency of the "in line" solution and the flexibility of the solution based on the formation of a chain of interfolded products of indefinite length.

[0011] According to the present invention, this scope is attained thanks to a process and an apparatus having the characteristics specified in the claims attached hereto. The invention also concerns the product obtained by means of the said process.

[0012] The invention will now be described, though only by way of an example not to be considered as limitative in any manner or wise, by reference to the drawings attached hereto, where:

Figure 1	shows a general and schematic plan view of the structure of an apparatus in accordance with the invention,
Figure 2	shows a side elevation at a somewhat larger scale of the part of the apparatus indicated by the arrow II in Figure 1,

Figure 3 shows a general perspective view of the operating characteristics and modalities of one of the elements represented in Figure 2,

Figures 4, 5 and 6 illustrate various phases of the implementation of the process in accordance with the invention, and

Figure 7 illustrates the possible appearance of a stack of interfolded articles realized in accordance with the invention.

[0013] The reference number 1 in Figure 1 indicates the whole of an apparatus used for realizing packs of interfolded laminar articles. In typical application examples, the products in question could be handkerchiefs (either dry or prehumidified, where the latter constitute a preferential field of application of the invention).

[0014] In essential terms, the apparatus 1 consists of a certain number processing stations or units arranged in cascade in the direction of flow that, commencing from a starting material constituted by a reel or bobbin S of laminar material (cellulose wadding, for example, or a so-called nonwoven fabric, possibly prehumidified), leads to the formation of packs P of individual articles interleaved with each other.

[0015] In particular, the first station or unit of the apparatus is to all intents and purposes identical with the similar station in a system for the realization of interfolded articles working in accordance with the "in line" solution described in some detail in the introductive part of the present description.

[0016] In particular, moreover, the station in question comprises a device 2 for supporting the reel S and unwinding it in a controlled manner towards a longitudinal cutting device 3 where the laminar material of the reel S becomes subdivided in a known manner into n strips or webs R1, R2, ..., Rn that are fed forward to a shaping / interfolding device 4.

[0017] For reasons that will soon become readily understood, the number n of webs obtained by cutting the reel S will generally be on the small side (in a typical case, for example, the value of n could be 10), and is usually much smaller than the number of webs that will normally be present in an "in line" interfolding apparatus of the traditional type, where the number n de facto identifies the number (generally rather high, and at times even of the order of hundreds or more) of articles comprising the interfolding pack.

[0018] After possibly having passed across a humidifier device 3b (not present when dry handkerchiefs are to be produced), the webs R1, ... R, R10 move forward to a shaping and interfolding unit 4 (a so-called "folder" and of a known structure), where the strips R1, ..., R10 are combined into a composite interfolded strip or web CW having the profile schematically illustrated by Figure 4 as its transverse section.

[0019] More particularly, in the particular embodiment here illustrated, which is no more than an example, it has been supposed that there are present ten such webs R1, ..., R10, each folded in accordance with a so-called V-fold (sometimes also known as a U-fold) at the moment of the interleaving. But the profile conferred upon each individual web could also be different, a Z-fold for example.

[0020] An important characteristic of the solution according to the invention is constituted by the fact that the strips R1 and R10, situated at the two limits of the interleaving pattern (and therefore normally the first and the last of the webs that make up the composite web CW) are not folded in such a manner as to constitute a symmetrical or substantially symmetrical V-fold, as is the case of the other strips R2 to R9.

[0021] Indeed, the aforesaid two end webs R1 and R10 are folded in such a manner as to present a respective branch (usually the branch external to the interfolded composite web CW) that project laterally beyond the section profile of the said composite strip or web.

[0022] In the particular embodiment here illustrated, where the number n of the strips subjected to interfolding is even (n=10), the said external branches (respectively indicated in Figure 4 by W1 and W10) of the two end webs R1 and R10 project on opposite sides of the composite web CW. In cases where the number n is odd, the two projections would generally be on the same side, always provided that the V-fold is retained. However, it will be understood from the present description (which is made with specific reference to the solution in which the number n is equal to 10) that both solutions are possible in principle. Further, in case of a particularly simple form of embodiment of the invention (packs of articles made up of only two stacks) one can think of operating even when only one of the two projecting branches W1 and W10 is actually available.

[0023] The modalities that make it possible for the previously described unsymmetrical fold to be conferred upon the end webs R1 and R10 as they pass through the unit 4 are wholly obvious to a technical expert familiar with the technology here considered and need not be described in detail at this point. In practice, it is sufficient to arrange matters in such a manner that the webs R1 and R10 subjected to folding will be fed to the folding unit in an at least slightly unsymmetrical manner and not symmetrically as is done for all the other webs R2 to R9 comprised within the body of the composite web CW.

[0024] Still in substantial analogy with traditional devices operating on the "in line" principle, the composite web CW - which in the example here illustrated comprises ten individual interfolded webs - is passed on to a cutting unit 5 intended to segmentate the composite web CW into individual parts, each constituting a stack of individual articles interleaved with each other.

[0025] In substance, therefore, the cutting unit - always in the embodiment here illustrated - receives the composite web CW from above (on the left-hand side in Figure 2, where it can be seen that the general structure of the unit 5 is symmetrical, thus rendering the unit capable of receiving composite webs arriving from either side) at a point where two motor-operated belt conveyors indicated by the reference number 6 receive and drag the said web.

[0026] The composite web CW thus moves forward between the two facing branches of the conveyors 6 to a cutting device 7, the characteristics of which will be described somewhat further on.

[0027] Either upstream or downstream of the cutting device 7 (downstream in the embodiment here illustrated) the web encounters a sectioning unit 7a (which likewise will be described in detail further on) having the function of separating tracts of the composite web CW intended to form stacks of interleaved articles that are to be comprised in different packs.

[0028] The reference number 8 indicates a folding device that - in the embodiment here illustrated - consists of two symmetrical and otherwise identical units.

[0029] After being subjected to cutting and sectioning in the devices 7 and 7a , the web CW is received at the input end of the folding device between the two facing branches of two other motor-operated conveyor belts 9 forming part of a deviation (deflection) unit 10 of a known type. The deflection unit routes the web CW alternatively to one or the other of the said symmetrical units 12 . Each of the units in question consists in practice of a zig-zag folding device, again of a known type, capable of folding the web CW into the desired zig-zag or accordion pattern and then depositing it in the form of a compact pack P inside a reception conveyor 13 that extracts it from the unit 5.

[0030] As can be seen from the different positions in which they are shown in the lower part of Figure 2, the two conveyors 13 (and. more generally, the two units 12) are intended to operate in an alternating sequence. This choice made with the intention of optimizing the exploitation of the operating capacity of the unit 5 , is nevertheless not in any way imperative and, in any case, not of itself relevant for the purposes of the invention.

[0031] As can be better appreciated from an examination of Figures 3 and 4, the cutting operation performed in the cutting device 7 is implemented in such a manner as to completely affect the body of the composite web CW, but to affect only partly the projecting branches W1 and W10 of the two webs R1 and R10 situated in the two terminal positions of the interfolding pattern.

[0032] This result can be obtained, for example, by configuring the cutting device 7 in the form of two counter-rotating elements 14, 15 , each of which carries a cutting edge 141, 151 and a counterpart element (counter-knife or anvil) 142, 152 in diametrically opposite positions.

[0033] It is however quite evident that the cutting device 7 can also be realized in a manner altogether different from the one here illustrated without in any way changing the desired final result: for example, by using several knives in cascade and/or knives in linear rather than rotary motion, etc.

[0034] In the embodiment here illustrated, the composite web CW is made to move forward between two counter-rotating elements 14, 15 that are operated in such a manner as to subject the web CW alternatively to the action of the cutting edge 141 (or 151) of one of the elements (14, or 15) and sustained on the opposite side by the counter-knife 152 (or 142) of the other of the elements (15, or 14) . In other words, the two elements 14, 15 are operated in counterphase with respect to each other.

[0035] At their opposite ends (i.e. respectively aligned with the margin W1 and the margin W10), moreover, the cutting edges 141 and 151 are each provided with a kind of notch or solution of continuity 141a , 151a intended to ensure that the region of the margin W1 or W10 affected on each occasion by the action of the cutting edge 141 or 151 will, as it were, be "spared" being cut in the area corresponding to the said notch.

[0036] Consequently, (please refer to Figures 3 and 4), the said action of "sparing" or "exempting" the external branches W1 and W10 of the terminal webs R1 and R10 from the cutting action is not realized on the occasion of all the cutting or segmentation operations to which the composite web CW is subjected, but only on the occasion of one cutting action out of every two, thus producing an alternating sequence as far as the two webs R1 and R10 in the terminal positions are concerned.

[0037] In practice (as can again be readily seen from Figures 3 and 4), whenever the branch W1 of the web R1 is spared the cutting action, the external branch W10 of the web R10 will be cut. At the next cutting action, however, the previously cut branch W10 will be spared (though only within the limits of brief tract of the external margin) the cutting action, which on this occasion will however take place in the whole of the external branch W1 of the other terminal web R1, and so on.

[0038] Consequently, from the composite web CW there is thus generated a chain of stacks or modules B that, rather than being wholly separated from each other, are still interconnected by means of the bridgelets M consisting of the very portions of the external branches (W1 or W10) of the terminal webs that on each occasion have been spared the cutting operation.

[0039] More particularly, it will be readily appreciated that, since the cutting operation spares first the branch W1 and on the next occasion the branch W10, the whole in alternating sequence, the stacks B making up the chain that leaves the cutting device 7 are interconnected by bridgelet formations M arranged alternately on one or the other side (margin) of the composite web CW.

[0040] In the leftmost part of Figure 5 it can be seen that, downstream of the cutting device 7, the chain of stacks B of interleaved articles produced by the previously described (selective) cutting action is subsequently subjected - in the units 12 - to a zig-zag (or accordion) folding operation that is usually implemented by leaving on each occasion the respective bridgelet M on the internal side of the folds of the folding pattern.

[0041] The said folding operation ensures that the individual stacks B become superimposed on each other, thus ultimately giving rise to a pack of interfolded articles of the type shown in Figure 6, which in general comprises a number m of stacks B.

[0042] The number m may be freely chosen in accordance with specific user needs. In actual practice, the choice of the number m corresponds to the choice of the instant at which the sectioning unit 7a is to come into action. This device may be constituted by any kind of element situated either upstream or downstream of the device 7 , and therefore also immediately upstream of the folding units 12 , capable of intervening at the desired instant - by means of an appropriate command - in such a manner as to subject the corresponding section of the web CW to some stress - a longitudinal traction for example - and thus to cut or tear one of the bridgelets M of the chain created by the cutting device 7. All this in such a manner as to ensure that the pack of m stacks formed in one or each of the folding units 12 will be separated from the one that will subsequently be formed. In a presently preferred embodiment of the invention, the sectioning unit 7a comprises one or two pairs of rolls arranged in cascade that, at the desired instant, i.e. when the bridgelet M to be severed (identified by means of a normal counting operation implemented in a known manner - for example, by means of an optical sensor not shown on the drawings) has just passed beyond the (first) pair of rolls, will close onto the composite web, thus slowing it down upstream of the bridgelet (and accelerating it downstream thereof whenever a second pair of rolls is present for this purpose). In this way, that is to say, ensuring that the tracts of web CW that are to be comprised in different packs will be separated from each other, each pack P of interfolded articles can be freely extracted from the respective conveyor 13 and sent to a packaging unit (boxing or wrapping machine, etc.).

[0043] The pack P obtained in this manner is made up of individual articles associated with each other in accordance with a general interleaving scheme of one type or another.

[0044] In particular, as regards the articles situated in the interior (and therefore not in either of the terminal positions) of each of the stacks B, the interfolding scheme is to all intents and purposes the traditional one known to the state of the art. As regards the articles in the two terminal positions of each stack B, on the other hand, the linking on the internal side of the respective stack corresponds to an interfolding of the traditional type, while on the external side of the respective stack B the linking with the homologous article of the adjacent stack B (the article in question is described as homologous in the sense that it, too, is situated on the external side of the corresponding stack B) is implemented by means of one of the bridgelets M: the result obtained in this manner is however exactly what is desired, namely to make sure that even for the articles situated on the margins of the respective stack B, the removal from the pack P of one article will imply the dragging forward of the next article, which will thus in its turn become predisposed for being pulled out of the pack. This result is obtained thanks to the bridgelet M, the dimensions of which are chosen in such a manner as to ensure - taking due account of the characteristics of the material of which the articles are made - an optimal compromise between the need for guaranteeing the dragging forward of the next article whenever the previous article is removed from the pack and the need for ensuring that the link between the two articles in question represented by the bridgelet M will effectively be ruptured, thus separating the two articles, by the dragging action that the user exerts when pulling the individual articles out of the pack.

[0045] In actual practice, given appropriate selection of the dimensions of the bridgelets M (which may either be a single structure or consist of several elements placed side by side) and taking due account of:

- the nature and the characteristics of the material of which the interfolded articles are made,
- the interfolding scheme (pattern) and / or
- the size and / or the shape of the aperture T of the package B into which the pack P of articles is inserted,

one obtains the desired result of ensuring that, whenever from the pack P there is removed an article that is linked to the next article by means of a bridgelet M, the said bridgelet will rupture, though only after having predisposed the next article for being pulled out of the pack through the aperture T. All this without the user noting and / or becoming aware of any behaviour different from the one to which he is accustomed when the two articles in question are simply interleaved and not in any other way connected with each other. In other words, the bridgelet formations M are realized in such a manner as to rupture under the action of a tractive force substantially identical to the one that the user exerts when he extracts from the package B and through the aperture T any other article of the pack P devoid of bridgelet formations M and therefore simply interleaved with the next article.

[0046] In general, the solution in accordance with the present invention makes it possible to realize packs P (and therefore packages B) that in general contain m x n interfolded articles. The whole with the possibility of freely choosing the number m, which can be varied

without any difficulty (in actual practice this is simply a matter of intervening on the control organ of the cutting or tearing device that segmentates the chain of stacks B in such a manner as to cause it to act at different moments according to the actual value of m it is desired to obtain), and with the consequent possibility of selecting a particular value of m also for the realization of small lots of articles. The flexibility of the system is correlated with the possibility of choosing for the number n of webs interfolded in the unit 4 a value (constituting the operating "module" of the device) such as to make it possible to obtain a sufficiently dense coverage of different formats (different products m x n). The experiments so far carried out by the applicants also show that the choice of a value n equal to ten makes it possible to cover in an altogether satisfactory manner all the needs of the present-day production of such articles as paper handkerchiefs, including those of the type currently known as "wet wipe", "facial tissue" or similar products.

[0047] Without prejudice to the principle of the invention, the realization details and the embodiment forms can of course be extensively varied as compared with what has here been described and illustrated, and this without in any way overstepping the bounds of the invention.

Claims

1. A process for realizing packs (P) of interfolded laminar articles, comprising the operations of:

   - providing a plurality (n) of webs (R1, ..., R10) of laminar material and subjecting the said webs (R1, ..., R10) to an interfolding operation such as to create a composite web (CW) having an interleaved structure, and
   - segmentating the said composite web (CW) by means of a cutting operation in such a manner as to give rise to successive stacks (B) of interfolded articles,

   characterized in that:

   - the said interfolding operation is realized in such a manner that at least one of the two webs (R1, R10) of the said plurality situated in the terminal positions of the said composite web (CW) has a respective external branch (W1, W10) projecting beyond the said composite web (CW),
   - the said cutting operation is realized in such a manner as to spare at least partly the said at least one external branch (W1, W10), so that the said stacks (B) deriving from the said cutting operation will be linked to each other as a chain by means by tearable bridgelet formations (M) corresponding to the portions of the said at least one margin (W1, W10) spared by the cutting operation,
   - the said chain is subjected to a folding operation in such a manner as to give rise to packs (P) that each comprise a given number (m) of the said stacks (B), and
   - the tracts of the said composite web (CW) intended to be comprised in successive packs (P) are separated (7a).

2. A process in accordance with Claim 1, characterized in that the said tracts of the composite web (CW) intended to be comprised in successive packs (P) are separated (7a) after the said cutting operation by selectively rupturing the bridgelet formations preserved between successive packs (P).

3. A process in accordance with Claim 1, characterized in that the said tracts of the composite web (CW) intended to be comprised in successive packs (P) are separated before the said cutting operation.

4. A process in accordance with any one of Claims 1 to 3, characterized in that:

   - the said webs (R1, ..., R10) are subjected to interfolding in such a manner that both the webs (R1, R10) situated in the terminal positions of the said composite web (CW) have respective external branches (W1, W10) that project beyond the said composite web (CW),
   - the said cutting operation is performed in such a manner as to spare at least partly both the one (W1) and the other (W10) of the said external branches in an alternate sequence, so that the said stacks (B) comprised in the said chain will be linked to each other by bridgelet formations (M) arranged alternately at one and the other of the margins of the said composite web (CW), and
   - the said chain is subjected to an accordion-type folding operation.

5. A process in accordance with Claim 4, characterized in that the said accordion-type folding operation is implemented by leaving the said brigelet formations (M) on each occasion on the internal side of the fold of the accordion-type folding pattern.

6. A process in accordance with any one of the preceding claims, characterized in that the said webs (R1, ..., R10) consist of sheeted material for the realization of such hygienic products as paper handkerchiefs or similar products.

7. Apparatus for realizing packs (P) of laminar interfolded articles comprising:

   - a shaping device (4) for receiving as input a

plurality (n) of webs (R1, ..., R10) of laminar material and subjecting them to an interfolding operation such as to create a composite web (CW) having an interleaved structure, and

- cutting means (7) for segmentating the said composite web and thus giving rise to successive stacks (B) of interleaved articles,

characterized in that:

- the said shaping device (4) realizes the said interleaving operation in such a manner that at least one of the two webs (R1, R10) of the said plurality situated at the terminal positions of the said composite web (CW) has a respective external branch (W1, W10) projecting beyond the said composite web (CW),
- the said cutting means (7) spare at least partly the said at least one external branch (W1, W10), so that the said stacks (B) deriving from the said cutting operation will be linked to each other as a chain by tearable bridgelet formations (M) corresponding to the portions of the said at least one margin (W1, W10) spared by the said cutting means,
- there are provided folding means (12) for subjecting the said chain to a folding operation so as to give rise to packs (P) that each comprise a given number (m) of the said stacks (B), and
- there are provided separating means (7a) for separating the tracts of the said composite web (CW) intended to be comprised in successive packs.

8. Apparatus in accordance with Claim 7, characterized in that the said separating means (7a) act between the said cutting means (7) and the said folding means (12) and selectively rupture the bridgelet formations (M) preserved between successive packs (P).

9. Apparatus in accordance with Claim 7, characterized in that the said separating means (7a) act upstream of the said cutting means (7).

10. Apparatus in accordance with any one of Claims 7 to 9, characterized in that the said separating means (7a) act by slowing down and / or accelerating the forward movement of the said composite web (CW)

11. Apparatus in accordance with any one of Claims 7 to 10, characterized in that:

- the said shaping device (4) realizes the said interleaving operation in such a manner that both the webs (R1, R10) of the said plurality situated at the terminal positions of the said composite web (CW) have respective external branches (W1, W10) projecting beyond the said composite web (CW),
- the said cutting means (7) spare at least partly either the one (W1) or the other (W10) of the said external branches in an alternating sequence, so that the said stacks (B) comprised in the said chain will be linked to each other by beams of bridgelet formations arranged alternately at one and the other margin of the said composite web (CW),
- the said folding means (12) subject the said chain to an accordion-type folding operation.

12. Apparatus in accordance with any one of Claims 7 to 11, characterized in that the said cutting means comprise at least one cutting edge (141, 151) intended to act on the said composite web (CW) and having a solution of continuity (141a, 151a) in position corresponding to the part of the said at least one external branch (W1, W10) that is to be spared the cutting operation.

13. A pack (P) interfolded laminar articles comprising a plurality of stacks (B) of interfolded laminar articles, where each stack (B) is constituted by a segment of a composite web (CW) made up of a plurality (n) of webs (R1, ..., R10) interleaved in such a manner that at least one of the webs (R1, R10) of the said plurality situated in the terminal positions of the said composite web (CW) will have a respective external branch (W1, W10) that projects beyond the said composite web (CW); the said blocks (B) being linked to each other as a chain by means of rupturable bridgelet formations (M) constituted by a part of the said respective external branch (W1, W10) of the said at least one of the said webs (R1, R10) situated in the marginal positions of the composite web (CW).

14. A pack (P) of interleaved laminar articles in accordance with Claim 13, characterized in that:

- the said webs of the said plurality (R1, ..., R10) are interleaved in such a manner that both the webs (R1, R10) situated in the marginal positions of the said composite web (CW) have respective external branches (W1, W10) that project beyond the said composite web (CW), and
- the said stacks (B) are linked as a chain in a general accordion-type pattern by means of the said bridgelet formations (M).

15. A pack of interleaved laminar articles in accordance with Claim 13 or Claim 14, characterized in that:

the said pack is inserted in a package (B) provided with an opening (T) for pulling out the articles.

- the dimensions of the said bridgelet formations (M) are chosen in such a manner that the formations that link two successive articles in the pack (P) and belong to different stacks (B) will rupture when the first of the said successive articles is pulled out of the said opening (T) as the result of a traction substantially similar to the traction that that will cause any one of the articles of the pack (P) devoid of the said bridgelet formations (M) to pull out of the package (B).

16. A pack of laminar interleaved articles in accordance with either of the preceding Claims 11 or 12, characterized in that the said articles are made up of sheeted material for the realization of such hygienic products as paper handkerchiefs or similar products.

FIG. 1

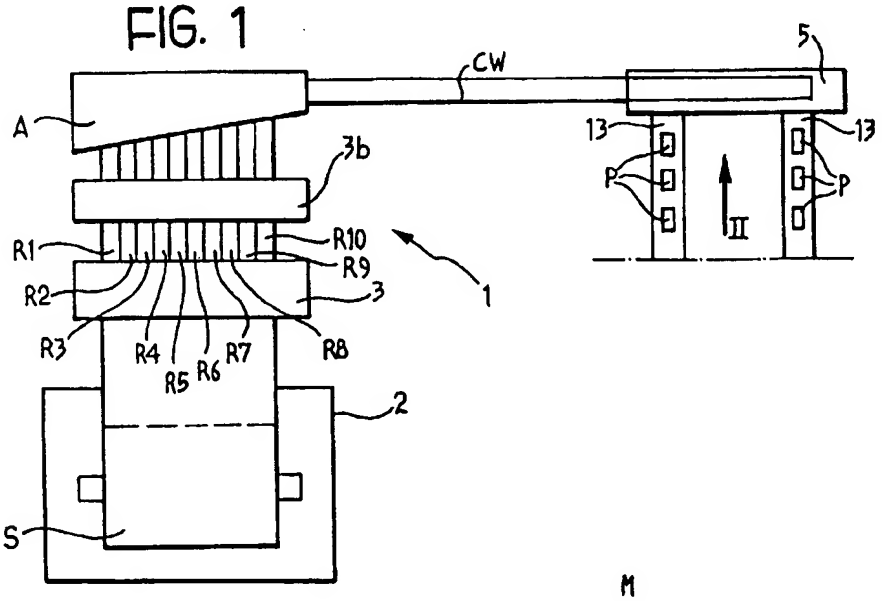


FIG. 3

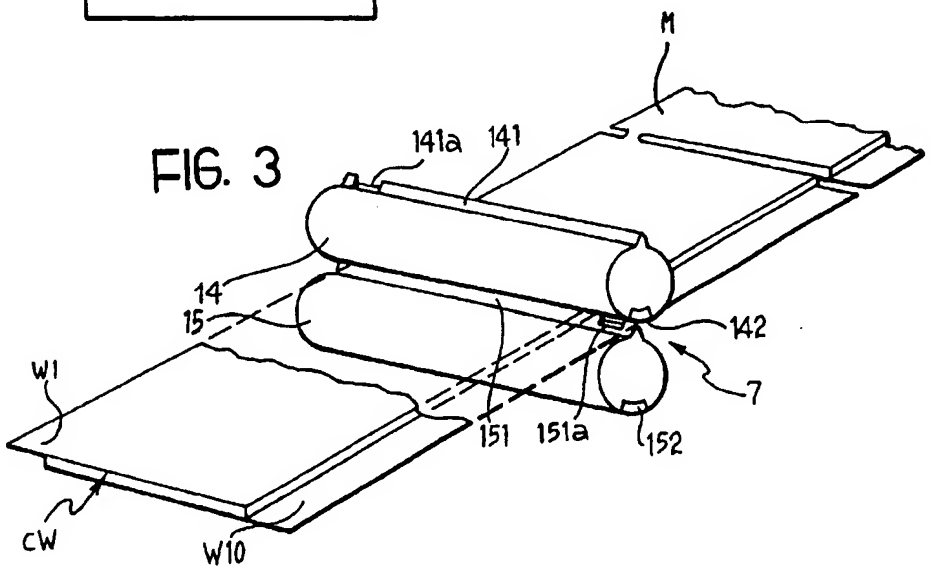


FIG. 4

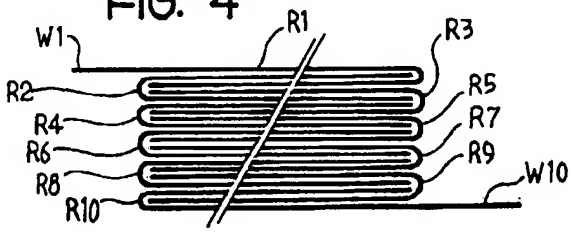


FIG. 2

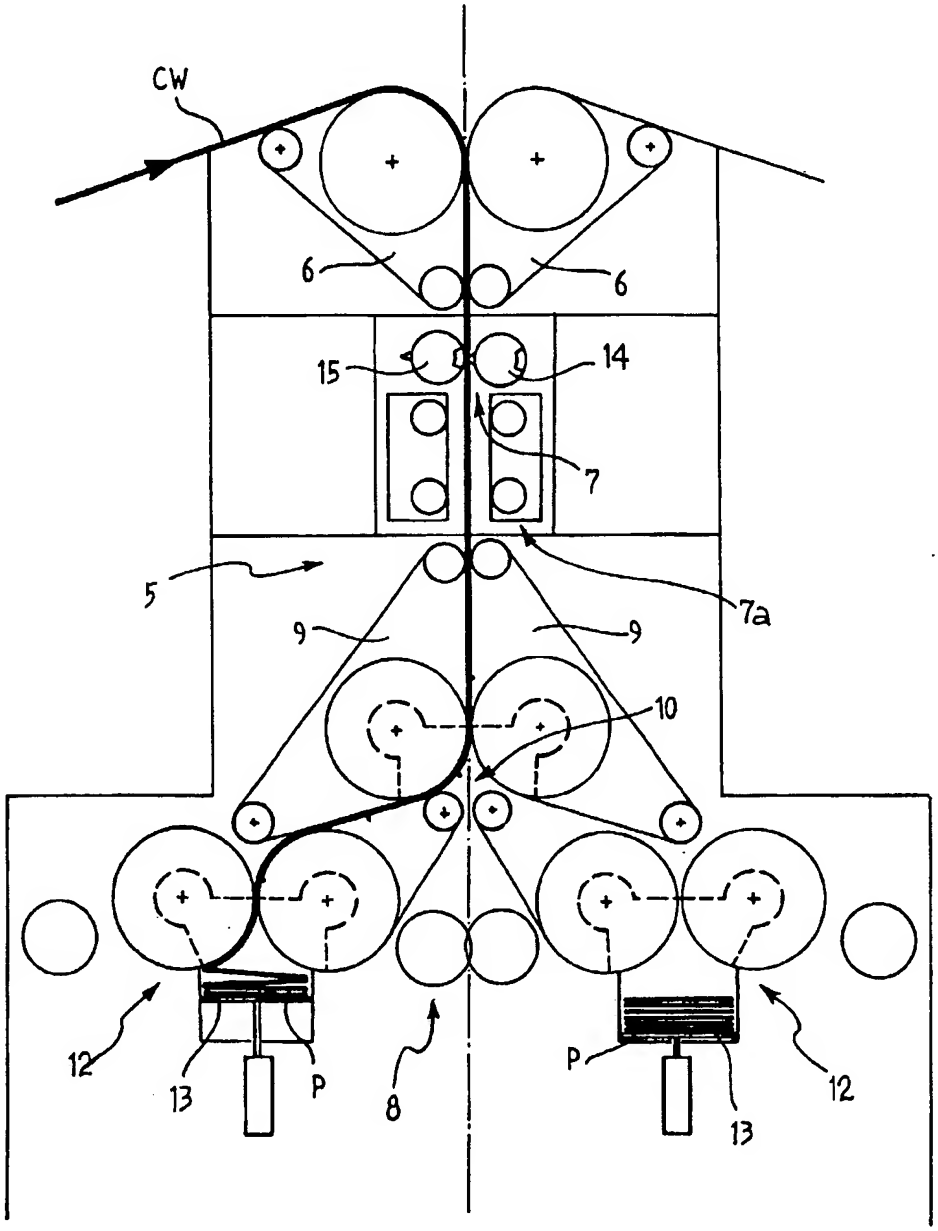


FIG. 5

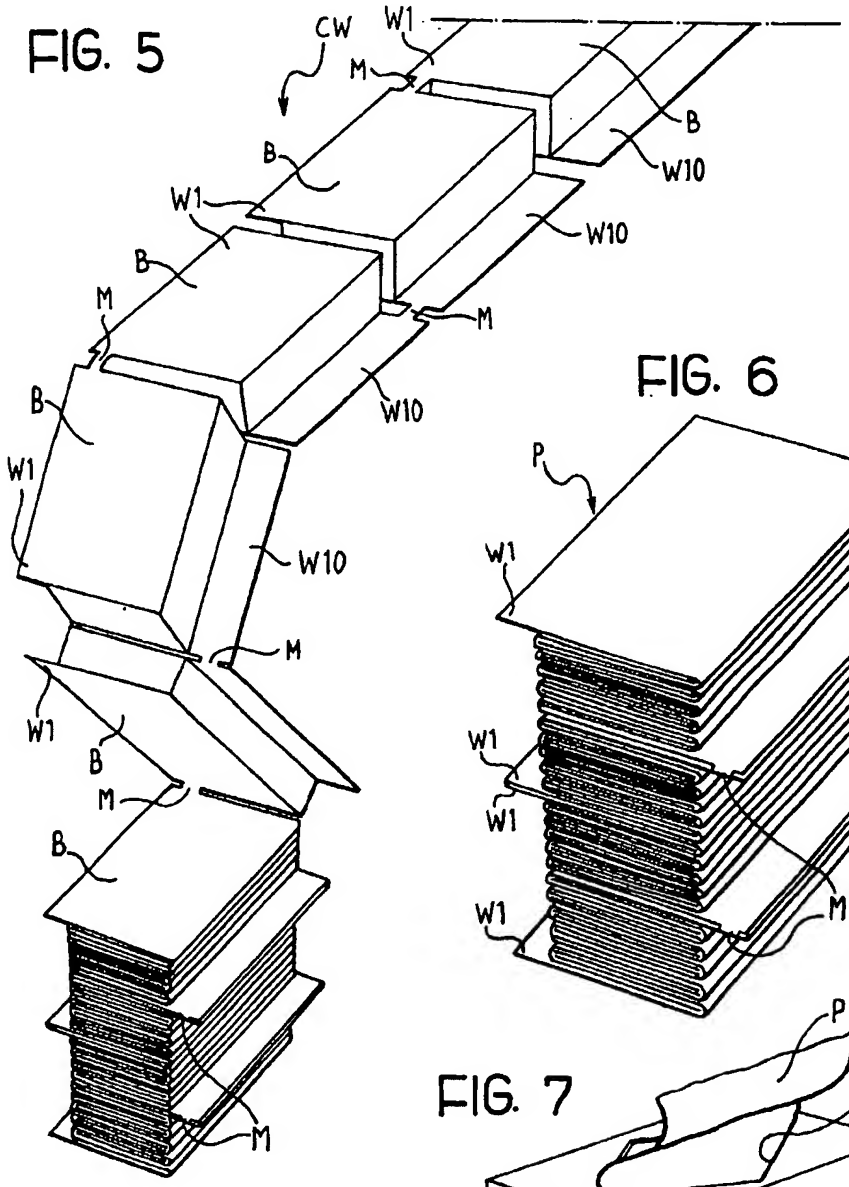
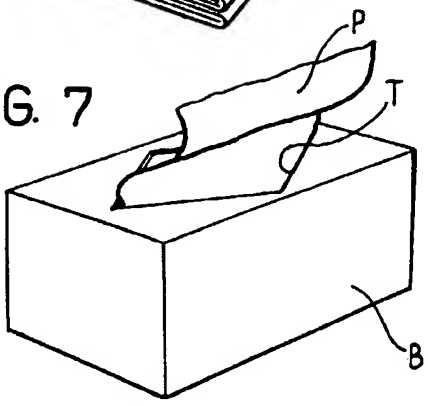


FIG. 6

FIG. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 98 83 0267

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	DE 43 36 933 A (HOBEMA MASCHINENFABRIK HERMANN H. RATHS GMBH) 4 May 1995 * column 3, line 38 - column 5, line 31; figures 1-3 *	1,6,7, 13,16	B65H45/28 B65H45/24 B65H45/101
A	GB 2 028 774 A (PAPER CONVERTING MACHINE COMPANY) 12 March 1980 * the whole document *	1,7,13	
A	US 4 203 584 A (J. B. SMAW) 20 May 1980 * the whole document *	1,7,13	
A	FR 2 588 253 A (IMPRIMERIE FLOCH) 10 April 1987 * page 48, line 7 - page 49, line 22; figures 1-4,12-22 *	5,11,12, 14,15	
A	GB 291 512 A (NORTHERN PRESS ENGINEERING CO.) * page 3, line 61 - line 126; figures 1,2,5 *	1,7,13	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B65H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	7 October 1998	Raven, P

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